[00117] U.S. Patent Application titled "Systems and Methods for Designing a New Material that Best Matches a Desired Set of Properties," filed in October 2002 and assigned U.S. Patent Application Serial No. $^{10/281,658}$ discloses and describes scoring methods and algorithms; the entire contents of the patent application are incorporated herein by reference.

[00118] 3.c. Merging Data Algorithm

[00119] The user inputs for the merging data algorithm are (1) all the individual composite crude slate scores corresponding to each crude slate as determined by the crude slate data algorithm; (2) all the individual composite operational scores corresponding to the individual parameters and/or conditions as determined by the scoring operational data algorithm; and (3) response parameters and/or conditions of interest to the user, such as probability of refinery fouling, desalter efficiency, and probability of refinery corrosion.

[00120] The merging data algorithm processes the input data and provides as outputs in ascending or descending order the crude slates having the highest total overall composite scores by combining composite crude slate and composite operational scores to obtain the overall or composite score. In a preferred embodiment, the overall or composite score for each crude slate is obtained by extending the weighted geometric average approach by multiplying the two individual composite scores corresponding to each crude slate which were obtained by the scoring crude slate data and scoring operational data algorithms. In the example below, the individual scores are weighted as equally high importance (the importances range from 1-5):

[00121] $[(\text{Composite Crude Slate Score})^5 (\text{Composite Operational Score})^5]^\wedge(1/10)$

[00122] The merging data algorithm also outputs response parameter values for the response parameters and/or conditions of interest to the user, and treatment information for the specific refinery. The treatment information includes information for treating the response parameters and/or conditions of interest to the user, as well as other possible refinery responses.

[00123] FIG. 8 illustrates an exemplary screen view showing the score results of selected crude slates. In a first column 800, the user can select a crude slate by